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10/022,876	12/20/2001	Makoto Kano	217670US2S	6385

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EXAMINER

SAXENA, AKASH

ART UNIT	PAPER NUMBER
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2128

DATE MAILED: 08/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/022,876

Applicant(s)

KANO ET AL.

Examiner

Akash Saxena

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 20 December 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 10/022,876.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/2/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. Claims 1-26 have been presented for examination based on the application filed on 20<sup>th</sup> December 2001.

#### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copies have been filed in parent Application No. JP 2001-077040 filed on 16<sup>th</sup> March 2001 and Application No. JP 2000-393532 filed on 25<sup>th</sup> December 2000.

#### ***Information Disclosure Statement***

3. The information disclosure statement (IDS) submitted on 2<sup>nd</sup> April 2003 was filed after the mailing date of the Specification on 20<sup>th</sup> December 2001. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

#### ***Claim Objections***

4. A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

Claims 6-15 are objected to because of the break in the sequence from claim 1.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 2 recites the limitation "said environment state". There is insufficient antecedent basis for this limitation in the claim. Claims 17 & 23 are rejected for the same reason as claim 2 above.

Claims 3-5 are rejected based on the their dependency on claim 2.

Claims 18-21 are rejected based on the their dependency on claim 17.

Claims 24-26 are rejected based on the their dependency on claim 23.

6. Claim 3 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 is dependent from claim 2 and discloses "state of a subject" and "state of environment". The claim is indefinite as it is unclear if these states are same as "said subject state" and "said environment state", disclosed in claim 2. Appropriate corrections are required. Claims 18 & 24 are rejected for the same reason as claim 3 above.

Claims 4-5 are rejected based on the their dependency on claim 3.

Claims 19-20 are rejected based on the their dependency on claim 18.

Claims 25-26 are rejected based on the their dependency on claim 24.

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7. Claim 4 & 5 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 4 is vague and indefinite as it discloses, "converting [...] a variable value [...]" without disclosing any further details about it. Further, claim 5 discloses details of conversions without any details what the variable represents. Hence both claims are rejected as being vague and indefinite.

Claims 19-20 & 24-25 are rejected for the same reasons as claim 4 & 5.

***Claim Interpretation***

8. Claim 12 discloses, "[...] designating partial time [...]". As best understood by examiner this means assigning a time slot to the simulation (e.g. 5-10 sec).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- 9. Claims 1-4, 6, 9-14, 16-19 & 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by IEEE article “Dynamic Traffic Simulation for Controlling Traffic Flow” by Takayoshi Yokota et al (YO 1993 hereafter).**

Regarding Claim 1

YO 1993 teaches simulation program product controlling plurality of simulation models, which simulate the operation of a subject (YO 1993: Abstract; Pg. 259, Col.1 Section 1, ¶ 2 Lines 9-14; Pg.259 Col.2 Section 2.1, Lines 1-4, 15-16; Pg.260 Section 2.2; Fig.3). Further, YO 1993 teaches entering initial state for the model simulation (YO 1993: Pg.260, Col.1 ¶1 Lines 4-7; Pg. 261, Section 3.1), entering simulation condition (YO 1993: Pg.260, Col.1 ¶1 Lines 8-12; Pg.259 Fig 1-Information Provision Model; Pg.261 Section 3 ¶ 2) and selection condition for simulation model (YO 1993: Pg.260 Section 2.2; Fig 2,3). Further, YO 1993 teaches model selection means based on selection condition, i.e. flow rate in the present example and outputting for simulation the correct mode/model (YO 1993: Pg.260 Section 2.2; Fig 2,3). Further, YO 1993 teaches simulation calculation means causing to set the initial state and set the simulation condition (YO 1993: Pg.261 Section 3 ¶ 2) and calculating the simulation (YO 1993: Pg.259 Section 2.1 ¶ 3).

Further, YO 1993 teaches result outputting means to output the result of the simulation from the simulation product/simulator (YO 1993: Pg.261 Section 3.3).

Regarding Claim 2

YO 1993 teaches simulation program product controlling plurality of simulation models, which simulate the operation of a subject (YO 1993: Abstract; Pg. 259, Col.1 Section 1, ¶ 2 Lines 9-14; Pg.259 Col.2 Section 2.1, Lines 1-4, 15-16; Pg.260 Section 2.2; Fig.3). Further, YO 1993 teaches entering initial state for the model simulation (YO 1993: Pg.260, Col.1 ¶1 Lines 4-7; Pg. 261, Section 3.1), entering simulation condition (e.g. duration of simulation) (YO 1993: Pg.260, Col.1 ¶1 Lines 8-12; Pg.259 Fig 1- Information Provision Model; Pg.261 Section 3 ¶ 2) and selection condition for simulation model (YO 1993: Pg.260 Section 2.2; Fig 2,3).

Further, YO 1993 teaches model selection means based on selection condition, i.e. flow rate in the present example and outputting for simulation the correct mode/model (YO 1993: Pg.260 Section 2.2; Fig 2,3). The change in flow rate & Road Link information are also an environmental state selection factor (as it represents "information indicating a state of a environment other than the moving subject" - Spec: Pg.11 Lines 24-26). Further selection of model is also based on the state of the subject (e.g. velocity) and as can be seen (YO 1993: Fig.2) is also a factor for model mode selection.

Further, YO 1993 teaches setting the initial state and simulation condition (YO 1993: Pg.261 Section 3 ¶ 2) and calculating the simulation (YO 1993: Pg.259 Section 2.1 ¶ 3).

Further, YO 1993 teaches result outputting means to output the result of the simulation from the simulation product/simulator (YO 1993: Pg.261 Section 3.3).

Regarding Claim 3

YO 1993 teaches that the simulation condition has changing info containing content (YO 1993: Pg.260 Col.1 Lines 9-12). Further, YO 1993 teaches that the content is defined by the state of subject (e.g. "velocity" = speed + heading) and state of environment (e.g. link traffic flow rate). Further, YO 1993 teaches a threshold value set in advance for state of subject and/or state of environment (e.g. Flow rate threshold) (YO 1993: Fig.2). Further, selection content designate simulation models, which are different from each other (e.g. Free run mode model and Congestion mode model) (YO 1993: Fig.3).

Regarding Claim 4

YO 1993 teaches converting the "a variable value", for example "total travel time", based on the model (free-run /congested) they are in (YO 1993: Pg.260 Col.1 Lines 9-18; Section 2.2 ¶1).

Regarding Claim 6

YO 1993 discloses at least models (Congestion based model and cost based model) from which any one can or both be used selected to be used directly (YO 1993: Pg.260 Section 2.2, 2.3).



Regarding Claims 9,10 & 12

YO 1993 teaches dividing the simulation time in plurality of times and designating the simulation model for each time (YO 1993: Pg.261 Section 3.1 ¶2; Fig.3). Further, the simulation time can be divided into partial time and different models can be simulated in that time. YO 1993 discloses a map disclosing delays on sample network designating the partial times and congestion model gets assigned to it (YO 1993: Pg.261 Section 4.1; Fig 6(a) & 6(b)).

Regarding Claims 11 & 13

YO 1993 anticipates movement of a subject through plurality of segments with varying degree of congestion and hence application of different models applies at plurality of times in plurality of segments (YO 1993: Pg.260; ¶1 Lines 8-18; Section 2.2). YO 1993 teaches segments in space as links. For example, once the source destination is specified for a subject, it might travel between different links and encounter varying degree of delays and hence would have a different model applied to it based on the threshold applied for model switching or a specific selection condition (YO 1993: Fig 6(a) &(b)).

Regarding Claim 14

YO 1993 is concerned with reducing the travel time of a subject, hence the simulation can be viewed as being subject centric (YO 1993: Pg.262 "Conclusion").

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Regarding Claim 16

Method claim 16 discloses similar limitations as claim 1 and is rejected for the same reasons as claim 1.

Regarding Claim 17

Method claim 17 discloses similar limitations as claim 2 and is rejected for the same reasons as claim 2.

Regarding Claim 18

Method claim 18 discloses similar limitations as claim 3 and is rejected for the same reasons as claim 3.

Regarding Claim 19

Method claim 19 discloses similar limitations as claim 4 and is rejected for the same reasons as claim 4.

Regarding Claim 22

System claim 22 discloses similar limitations as claim 1 and is rejected for the same reasons as claim 1.

Regarding Claim 23

System claim 23 discloses similar limitations as claim 2 and is rejected for the same reasons as claim 2.

Regarding Claim 24

System claim 24 discloses similar limitations as claim 3 and is rejected for the same reasons as claim 3.

Regarding Claim 25

System claim 25 discloses similar limitations as claim 4 and is rejected for the same reasons as claim 4.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**10. Claims 5, 7-8, 15, 20 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over by IEEE article “Dynamic Traffic Simulation for Controlling Traffic Flow” by Takayoshi Yokota et al (YO 1993 hereafter), in view of paper presented at Mid Continent Transportation Symposium Proceedings “Development and Implementation of a Process for Reconciling Sub-area Macro and Micro Scale Modeling Applications” by William Troe (TO 2000 hereafter).**

Regarding Claim 5

Teachings of YO 1993 are shown in the preceding and parent claim 4.

YO 1993 teaches a conversion rule, but does not teach it to be dependent on the state of periphery and state of environment.

TO 2000 teaches concurrent macro-micro model simulation, with major portion of sub areas simulated under the macro model (regional model as disclosed) and area of interest (Traffic Analysis Zone (TAZ)) adapted/reconciled from the regional model with added detailed that require detailed information to create a micro model (TO 2000: Pg.3 Col.1; Bullet 2 “Focus on the sub area within regional model.”; Pg.1 Col.1, ¶1). The rule requires data dictating the state of periphery incorporated through the mathematical smoothing (TO 2000: Pg.3 Col.2 Bullet Point 4 & 5) and state of environment through non-subject specific details like lane geometry and counts (density) (TO 2000: Pg.1, Col.2 Section: “Data Collection”). Other details for variable conversion would be obvious by necessity.

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of TO 2000 to YO 1993 to perform variable conversion which would have been necessitated by the model switching between the regional (macro) model to micro model. The motivation to combine would have been that TO 2000 teaches implementation of model switching to make the best use of the data collected over time and augmenting micro model with such data (TO 2000: Pg.1 Col.1 Lines 27-31). Further, TO 2000 and YO 1993 are both analogous art detailing traffic simulation and modeling at macro and micro levels.

Regarding Claims 7 & 8

YO 1993 teaches a traffic simulator as taught in claim 1 above.

TO 2000 teaches selection condition includes dividing space into the (segment) Traffic Analysis Zone (TAZ) for micro model and have macro model simulated in other areas (TO 2000: Pg.3 Col.1; Bullet 2 "Focus on the sub area within regional model:").

Regarding Claim 15

TO 2000 teaches correlating/reconciling the used data between the macro (regional) model and micro model on a model switching (TO 2000: Pg.1 ¶1; Pg.3 Col.1; Bullet 2 "Focus on the sub area within regional model:").

Regarding Claim 20

Method claim 20 discloses similar limitations as claim 5 and is rejected for the same reasons as claim 5.

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Regarding Claim 26

System claim 26 discloses similar limitations as claim 5 and is rejected for the same reasons as claim 5.

**11. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over by IEEE article "Dynamic Traffic Simulation for Controlling Traffic Flow" by Takayoshi Yokota et al (YO 1993 hereafter), in view of Publication by Transportation Research Board Special Report 165 expansion "Revised Monograph on Traffic Flow Theory" by Dr. Nathan H. Gartner et al (GA 1998 hereafter).**

Regarding Claim 21

Teachings of YO 1993 are shown in the preceding and parent claim 17.

YO 1993 does not teach simulating various simulation models and calculating error differential between the two models.

GA 1998 teaches various models and error relative error and differential between the models using various mathematical distributions and outputting the result (GA 1998: Chapter 9 "Traffic Flow at Signalized Intersections"; especially section 9.4; Fig 9.3, 9.4).

It would have been obvious to one (e.g. a designer) of ordinary skill in the art at the time the invention was made to apply the teachings of GA 1998 to YO 1993 to create a relative error differential data between the various models. The motivation to combine would have been that YO 1993 and GA 1998 are analogous art dealing with traffic simulation and process of model selection (GA 1998: Chapter 10; esp. Section 10.7 & 10.8).



References Cited & Importance:

- Publication by Transportation Research Board Special Report 165 expansion "Revised Monograph on Traffic Flow Theory" by Dr. Nathan H. Gartner et al (GA 1998 hereafter). GA 1998 Chapter 10 is of particular importance as it deals with simulation & selection of models. Previous chapters suggest various model (Chapter 2, Section 2.3; Chapter 4-7) factors affecting these models (Chapter 3).
- Publication by Argon National Laboratory "Highway Traffic Simulation on Multiprocessor Computers" by U.R. Hanebutte et al (HA 1997 hereafter). HA 1997 reference presents a system implementation that can used to simulate highly segmented highway traffic with various degrees of automation with high fidelity in regards to driver control and vehicle characteristics in multi-lane traffic simulation.
- M.S. Thesis at Virginia Polytechnic Institute and State University "Analysis of Freeway Weaving Areas using CORRIDOR Simulator and Highway Capacity Manual" by Suresh Ramachandran (RA 1997 hereafter). RA 1997 details combining macro mad micro simulators in a same software package (Chapter 3: Methodology enclosed).
- Publication at 3<sup>rd</sup> Annual World Congress on Intelligent Transport Systems "Simulation Framework for Intelligent transportation Systems" by Thomas Ewing et al (EW 1996). This simulation combines various macro (road network, traffic flow, traffic management & traffic signals) and micro

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simulation model (in vehicle navigation systems, communication between vehicles and centers, variable message signs).

- Publication at 74<sup>th</sup> Annual meeting of the Transportation Research Board, "Generic Vehicle Speed Models based on Traffic Simulation: Development and Application" by Richard Margiotta et al (MA 1995). MA 1995 teaches micro models for speed and delay calculation for highway & geometric conditions based on analytical simulation.

***Conclusion***

12. All claims are rejected.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

14. **Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant.

Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

***Communication***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akash Saxena whose telephone number is (571) 272-8351. The examiner can normally be reached on 8:30 - 5:00 PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jean R. Homere can be reached on (571)272-3780. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Akash Saxena  
Patent Examiner GAU 2128  
(571) 272-8351  
Friday, August 05, 2005

Fred Ferris, GAU 2128

A handwritten signature in black ink, appearing to be 'FF', with a long horizontal line extending to the right.